CLAIMS

1. Use of an AChE-derived peptide, or any functional fragment thereof, as an agent for the induction of the production of granulocytes, wherein said peptide is denoted by SEQ. ID. NO.1.

2. Use of an AChE-derived peptide, or any functional fragment thereof, as an agent for the induction of the production of granulocytes in a subject in need, wherein said peptide is denoted by SEQ. ID. NO.1.

3. Use of an AChE-derived peptide, or any functional fragment thereof, as an agent for the induction of repopulation and/or rematuration of granulocytic cell populations, wherein said peptide is denoted by SEQ. ID. NO.1.

4. Use of an AChE-derived peptide, or any functional fragment thereof, as an agent for the induction of repopulation and/or rematuration of granulocytic cell populations in a subject in need, wherein said peptide is denoted by SEQ. ID. NO.1.

5. Use of an AChE-derived peptide, or any functional fragment thereof, as an agent for the enrichment of the granulocytic cell population, wherein said peptide is denoted by SEQ. ID. NO.1.

6. Use of an AChE-derived peptide, or any functional fragment thereof, as an agent for the enrichment of the granulocytic cell population in a subject in need, wherein said peptide is denoted by SEQ. ID. NO.1.

7. Use of an AChE-derived peptide, or any functional fragment thereof, as an agent for *ex vivo* or *in vitro* manipulation of cells to induce

granulocyte cell differentiation, wherein said peptide is denoted by SEQ. ID. NO.1.

8. Use of an AChE-derived peptide, or any functional fragment thereof, as an agent for pre-transplant priming of hematopoietic stem cells, wherein said peptide is denoted by SEQ. ID. NO.1.

9. Use of an AChE-derived peptide, or any functional fragment thereof, as an inducer of pro-inflammatory cytokines, wherein said peptide is denoted by SEQ. ID. NO.1.

10. The use as defined in claim 9, wherein said cytokines are selected from the group consisted of TNFα, IL-6, IL-1β.

11. Use of an AChE-derived peptide, or any functional fragment thereof, as an inducer of thrombopoietin, wherein said peptide is denoted by SEQ. ID. NO.1.

12. Use of an AChE-derived peptide, or any functional fragment thereof, in the preparation of a pharmaceutical composition for the treatment and/or prevention of conditions that trigger low granulocyte count, wherein said peptide is denoted by SEQ. ID. NO.1.

13. Use of an AChE-derived peptide, or any functional fragment thereof, in the preparation of a pharmaceutical composition for the treatment of leucopenia wherein said peptide is denoted by SEQ. ID. NO.1.

14. Use of an AChE-derived peptide, or any functional fragment thereof, in the preparation of a pharmaceutical composition for the enrichment of the granulocytic cell population, wherein said peptide is denoted by SEQ. ID. NO.1.

15. Use of an AChE-derived peptide, or any functional fragment thereof, in the preparation of a composition for use in pre-transplant priming of hematopoietic stem cells, wherein said peptide is denoted by SEQ. ID. NO.1.

16. A method of treatment of conditions that trigger low cell count of granulocytes, comprising the steps of administering a therapeutically effective amount of an AChE-derived peptide or a composition thereof to a subject in need.

17. A method of treatment of conditions that trigger low cell count of leukocytes, comprising the steps of administering a therapeutically effective amount of an AChE-derived peptide or a composition thereof to a subject in need.

18. The method as defined in any one of claims 16 and 17, wherein said AChE-derived peptide is denoted by SEQ. ID. NO.1.

19. A method for the prevention and/or treatment of conditions wherein lymphocyte activity is reduced, such as chronic stress, autoimmune diseases, inflammation, rheumatoid arthritis, multiple sclerosis (MS), amyotrophic lateral sclerosis (ALS), fibromyalgia, multiple chemical sensitivity, post-irradiation, chemotherapy in a subject in need, comprising administering a therapeutically effective amount of an AChE-derived peptide to an individual suffering or prone to said conditions, wherein said peptide is denoted by SEQ. ID. NO.1.

20. A method for inducing a shift in the activity of lymphocytes *in vitro* or *ex vivo*, comprising contacting an AChE-derived peptide with lymphocytes for a suitable period of time.

21. A method for detecting changes in the activity of lymphocytes, comprising measuring the expression of AChE-R on the surface of lymphocytes.

22. A method of treatment of conditions wherein lymphocyte activity is reduced, such as chronic stress, autoimmune diseases, inflammation, rheumatoid arthritis, multiple sclerosis (MS), amyotrophic lateral sclerosis (ALS), fibromyalgia, multiple chemical sensitivity, post-irradiation, chemotherapy in a subject in need, comprising obtaining blood from said subject, isolating immature cells and contacting said cells with an AChE-derived peptide, wherein said peptide is denoted by SEQ. ID. NO.1.

23. A method of priming of hematopoietic stem cells pre-transplant, comprising obtaining said cells, isolating from said cells a immature, CD34+ rich population, and exposing said cell population to an AChE-derived peptide, its functional fragments or derivates, or compositions comprising thereof, wherein said peptide is denoted by SEQ. ID. NO.1.

24. The method as defined in claim 23, wherein said cells may be obtained from the subject in need of said transplant or from another donor.

25. A method of inducing blood cells to produce cytokines, comprising obtaining said cells from a subject in need of cytokine-producing blood cells, isolating immature cells and contacting said cells with an AChE-derived peptide, wherein said peptide is denoted by SEQ. ID. NO.1.

Abstract

The present invention describes the use of an AChE-R-derived peptide, also known as ARP, as an inducer of hemopoietic cell differentiation and

expansion, specifically for the granulocytic population. In addition, the use of ARP as an inducer of thrombopoietin and pro-inflammatory cytokines is also presented. ARP may further be used in the pre-transplant priming of hematopoietic stem cells. Other uses and methods utilizing ARP are also described herein.p